

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>P100553</b>	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. <b>PCT/SG2004/000356</b>	International filing date (day/month/year) <b>26 October 2004</b>	(Earliest) Priority Date (day/month/year) <b>31 October 2003</b>
Applicant <b>AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH et al</b>		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

#### Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.
2. ☐ Certain claims were found unsearchable (See Box No. II).
3. ☐ Unity of invention is lacking (See Box No. III).
4. With regard to the title,
  - ☒ the text is approved as submitted by the applicant.
  - ☐ the text has been established by this Authority to read as follows:
5. With regard to the abstract,
  - ☐ the text is approved as submitted by the applicant.
  - ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. With regard to the drawings,
  - a. the figure of the drawings to be published with the abstract is Figure No. 3A
    - ☒ as suggested by the applicant.
    - ☐ as selected by this Authority, because the applicant failed to suggest a figure.
    - ☐ as selected by this Authority, because this figure better characterizes the invention.
  - b. ☐ none of the figures is to be published with the abstract.

**Box No. IV Text of the Abstract (Continuation of item 5 of the first sheet)**

A magnetic memory device includes transistors (316, 317) formed on a substrate and a common magnetic memory block (312) including multiple effective magnetoresistive elements (318, 319), a ferromagnetic recording (321), a non-magnetic space (323), and a free magnetic reading (322) layer formed above the transistors (316, 317). An extended common digital line (315) is located above the common magnetic memory block (312). The common magnetic memory block (312) is electrically connected with a respective source/drain electrode of the transistors (316, 317) through each a contact at a respective active area. The specific magnetization state of the ferromagnetic recording layer at the active areas can be changed by a heating process and applying an external field induced from the common digital line (315) and the bit (309, 311) or word (307) lines. The change in resistance of the effective magnetoresistive element (318, 319) can be detected by means of changing the magnetization state of the free magnetic reacting layer during reading, thus a smaller switching field is required.

**A. CLASSIFICATION OF SUBJECT MATTER**Int. Cl. <sup>7</sup>: G11C 11/15

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**DWPI:** G11C, Magnetoresistive, Random Access Memory, Transistor+**USPTO:** 365/158**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2004/0125646 A1 (DURLAM et al.) 1 July 2004 Abstract & Paragraphs 3-4, 16-27	
A	EP 1339065 A2 (KABUSHIKI KAISHA TOSHIBA) 27 August 2003 Abstract & Paragraphs 36-41, 45-48	
X	WO 2002/059973 A2 (INFINEON TECHNOLOGIES NORTH AMERICA CORP.) 1 August 2002 Abstract & Paragraph 3, Page 2 – Paragraph 3, Page 3	1-4, 10-12, 15, 18, 19, 25
A	US 2002/0036917 A1 (NISHIMURA et al.) 28 March 2002 Abstract, Paragraphs 14-35 & Figure 8	

☐ Further documents are listed in the continuation of Box C☒ See patent family annex

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  
11 January 2005Date of mailing of the international search report  
18 JAN 2005

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SG2004/000356

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member	
US	2004125646	US	2004125649
EP	1339065	CN	1469386
		JP	2003318370
		US	2003161197
WO	02059973	EP	1358679
		US	2002097598
US	2002036917	JP	2002176150
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.			
END OF ANNEX			